the anode **are reduced**" (col. 2, lines 56-63). In col. 3, lines 30-42, Keller concedes that corrosion and dissolution take place at a rate of 10% of the dissolution/corrosion rate of an anode used in a conventional electrolyte. Keller even contemplates in col. 5, lines 4-31 the possibility of saturating the electrolyte with anode constituents but admits that this leads to **critical levels of impurities without solving the dissolution/corrosion problem**.

Hence, Keller discloses a method of electrowinning aluminium with the view of **reducing anode wear by up to 90%**. Nowhere does Keller disclose a method which of electrowinning aluminium by which the anode can be maintained at least substantially **dimensionally stable**. Moreover, Keller does not disclose a method of electrowinning aluminium using an electrolyte at a sufficiently **low temperature** (to reduce the solubility of anode constituents) **to limit the contamination of the product aluminium by iron to an acceptable level**. Therefore, claim 66 which includes these features should be considered to be novel over Keller.

It is undisputed that Yamada et al. disclose electrodes containing iron oxide, in particular within a coating on a metal substrate (col. 6, lines 31-68). Furthermore, the anodes are used in an electrolyte (cryolite) at the convention temperature of 950°C (Examples 1 to 13 from col. 8, line 54 to col. 13, line 15).

As noted by the Examiner, Yamada et al. do not teach **maintaining a sufficient concentration of iron species in the electrolyte** to maintain the anode dimensionally stable. Moreover, Yamada et al. do not teach electrowinning aluminium in an electrolyte a sufficiently **low temperature** (to reduce the solubility of anode constituents) **to limit the contamination of the product aluminium by iron to an acceptable level**. Therefore, claim 66 which includes these features should be considered to be novel over Yamada et al.

<u>Non Obviousness of Claim 66:</u>

Starting from Keller, the skilled person is faced with the problem of inhibiting dissolution and corrosion of an anode having an iron oxide surface.

This problem is solved by maintaining a sufficient concentration of iron species in the electrolyte to keep the anode dimensionally stable, as defined in claim 66. The dimensional stability of the anode can be obtained without exceeding the acceptable level of contamination with iron of the product aluminium by operation with an electrolyte at a sufficiently low temperature so that the concentration of iron species in the electrolyte is limited by the reduced solubility of iron species in the electrolyte at the (sufficiently low) operating temperature, as further defined in claim 66.

On the one hand, Keller consistently teaches cell operation with an anode that has a reduced dissolution rate in the electrolyte and that corrodes. Keller does not teach dimensional stability or even substantial dimensional stability but consistently mentions dissolution and corrosion.

Moreover, nowhere does Keller teach maintaining the anode dimensionally stable without an unacceptable level of contamination with iron of the product aluminium. On the contrary, **the lower the dissolution and corrosion rate of the Keller's anode, the greater the critical contamination of the product aluminium** (col. 5, lines 4-31). In fact, **Keller teaches against inhibiting the corrosion/dissolution of the anode and producing aluminium having an acceptable level of contamination at the same time**.

On the other hand, nowhere does Keller suggest that anode corrosion and dissolution could be inhibited and aluminium produced with an acceptable contamination level by **operating the cell with an electrolyte at a sufficiently low temperature** so that the concentration of iron species in the electrolyte is limited by the reduced solubility of iron species in the electrolyte at the (sufficiently low) operating temperature **to limit the contamination of the product aluminium by iron to an acceptable level**. Keller does not address the characteristics of the electrolyte beyond the presence of anode constituents.

Yamada et al. disclose electrodes containing iron oxide. Nowhere do Yamada et al. teach or even suggest the addition of iron oxide to the electrolyte. In particular Yamada et al. do not suggest to add such iron oxide to keep the anode **dimensionally stable** and produce aluminium with an **acceptable level of contamination by iron**. Hence, Yamada et al. do not fill the gap between Keller and Applicant's claim 66.

Moreover, Yamada et al. consistently teach operation with an electrolyte at the conventional temperature of 950°C. Nowhere do Yamada et al. suggest **operation with a sufficiently low temperature** so that the concentration of iron species in the electrolyte is limited by the reduced solubility of iron species in the electrolyte at the operating temperature, **which consequently limits the contamination of the product aluminium by iron to an acceptable level**. Hence Yamada et al. do not fill this further gap between Keller and Applicant's claim 66 either.

It follows from the above analysis that the skilled person, based on Keller's and/or Yamada et al.'s teachings, cannot arrive at the invention as defined in Applicant's claim 66 in any obvious manner. Hence, claim 66 should be considered to be unobvious.

Patentability of Claims 67-80:

Claims 67 to 80 incorporate all the patentable features of claim 66 and should thus be considered to be equally patentable.

Respectfully submitted,

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